

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA26 | Washwood Heath to Curzon Street

Data appendix (AQ-001-026)

Air quality

November 2013

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Department
for Transport

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Contents

1	Introduction	1
2	Policy framework	1
3	Baseline air quality data	1
	3.1 Existing air quality	1
	3.2 Receptors	4
4	Dust impact evaluation and risk rating	5
5	Air quality assessment - road traffic	17
	5.1 Overall assessment approach	17
	5.2 Model inputs and verification	17
	5.3 Construction traffic model	19
	5.4 Operational traffic model	25
6	References	32

List of tables

Table 1: Annual mean pollutant concentrations recorded at continuous monitoring sites'	2
Table 2: Number of hours when hourly mean NO ₂ concentrations exceed 200µg/m ³ at continuous monitoring sites" ⁴	2
Table 3: Number of days when daily mean PM ₁₀ concentrations exceed 50µg/m ³ at continuous monitoring sites'	3
Table 4: Annual mean NO ₂ concentrations recorded at diffusion tube monitoring sites	3
Table 5: Evaluation and risk rating of construction activities	5
Table 6: Summary of construction dust impacts and effects	16
Table 7: Annualisation of NO ₂ diffusion tubes monitored concentrations	18
Table 8: Comparison of monitored and modelled NO ₂ concentrations	18
Table 9: Modelled receptors (construction phase)	20
Table 10: Background 2017 concentrations at assessed receptors	21
Table 11: Summary of ADMS-Roads annual mean NO ₂ results (construction phase)	23

Table 12: Summary of ADMS-Roads annual mean PM ₁₀ results (construction phase)	24
Table 13: Modelled receptors (operational phase)	25
Table 14: Background 2026 concentrations at assessed receptors	26
Table 15: Summary of ADMS-Roads annual mean NO ₂ results (operational phase)	28
Table 16: Summary of ADMS-Roads annual mean PM ₁₀ results (operational phase)	29

1 Introduction

1.1.1 The air quality appendices for the Washwood Heath to Curzon Street community forum area (CFA026) comprise:

- discussion of the policy framework (Section 2);
- baseline air quality data (Section 3);
- dust impact evaluation and risk rating (Section 4); and
- air quality assessment - road traffic (Section 5).

1.1.2 Maps referred to throughout the air quality appendix are contained in the Volume 5: Air quality Map Book.

2 Policy framework

2.1.1 The Birmingham Unitary Development Plan (BUDP)(2005)¹ includes policies 3.77 and 3.78 indicating that Birmingham City Council (BCC) is committed to improving air quality through modes of transport that reduce the impact of travel on air quality.

2.1.2 The Birmingham Development Plan currently under consultation (to replace the current BUDP), will include policies specific to air quality, which state that consideration must be given to air quality for projects within air quality management areas (AQMA), and where applicable mitigation must be sought to reduce the significant effects of development on any AQMA objectives.

3 Baseline air quality data

3.1 Existing air quality

Local authority review and assessment information

3.1.1 BCC has declared an AQMA for NO₂ and PM₁₀ covering its entire administrative area.

3.1.2 An air quality action plan² aimed at improving air quality through 12 actions has been implemented by BCC. Action 2010/1 explains the intention that BCC has to introduce a low emission zone within the city centre. BCC also intends to extend the red route network³, through action 2010/3. In regards to air quality and planning, action 2010/5 explains that BCC "will devise a policy for assessing the air quality implications of major planning developments in line with the Birmingham City Council Core Strategy".

¹ Birmingham City Council (BCC) (2005), *Birmingham Unitary Development Plan*.

² Birmingham City Council (BCC) (2011), *Air Quality Action Plan 2011*.

³ Red routes are selected roads in Birmingham on which stopping restrictions apply. It aims at "improving the traffic network by reducing delays caused by congestion due to inconsiderate parking."

Local air quality monitoring data

3.1.3 Monitoring sites within the study area that are considered relevant for this assessment are shown in Volume 5: Map AQ-01-026. The following sections provide a summary of the recorded pollutant concentrations at these sites.

3.1.4 The pollutant concentrations can be compared to the air quality standards:

- 40µg/m³ as an annual mean for NO₂ and PM₁₀;
- 200µg/m³ one-hour mean for NO₂ not to be exceeded more than 18 times a year (equivalent to the 99.8th percentile of the one-hour mean);
- 50µg/m³ 24-hour mean for PM₁₀ not to be exceeded more than 35 times a year (equivalent to the 90.4th percentile of the 24-hour mean); and
- 25µg/m³ as an annual mean for PM_{2.5}.

Continuous monitoring

3.1.5 This section summarises the results from the continuous monitoring sites that are considered relevant for the assessment of air quality in this study area.

Table 1: Annual mean pollutant concentrations recorded at continuous monitoring sites^{4,5}

Pollutant	Annual mean concentrations (µg/m ³)				
	2008	2009	2010	2011	2012
Birmingham Tyburn roadside (411577, 290491)					
NO ₂	No data	47	51	45	No data
PM ₁₀	No data	20	20	24	No data
Birmingham Tyburn urban background (411592, 290440)					
NO ₂	31	32	37	34	No data
PM ₁₀	18	20	25	23	No data
Birmingham Fore Street (407060, 286969)					
NO ₂	59	55	59	48	No data

Table 2: Number of hours when hourly mean NO₂ concentrations exceed 200µg/m³ at continuous monitoring sites^{6,7}

Site	Number of exceedances of hourly mean NO ₂ standard				
	2008	2009	2010	2011	2012
Birmingham Tyburn roadside (411577, 290491)	No data	0	1	0	No data
Birmingham Tyburn urban background (411592, 290440)	0	0	7	0	No data

⁴ Source: West Midlands Air Quality Group website; www.wmair.org; Accessed July 2013

⁵ Where no data is listed, there is currently no publicly available data available for that pollutant for that year.

⁶ No 99.8th percentile of hourly mean NO₂ concentration data is available

⁷ Source: West Midlands Air Quality Group website; www.wmair.org; Accessed July 2013

Site	Number of exceedances of hourly mean NO ₂ standard				
	2008	2009	2010	2011	2012
Birmingham Fore Street (407060, 286969)	22	1	10	No data	No data

Table 3: Number of days when daily mean PM₁₀ concentrations exceed 50µg/m³ at continuous monitoring sites^{8,9}

Site	Number of exceedances of daily mean PM ₁₀ standard				
	2008	2009	2010	2011	2012
Birmingham Tyburn roadside (411577, 290491)	No data	0	0	0	No data
Birmingham Tyburn urban background (411592, 290440)	No data	0	0	0	No data

Diffusion tubes

- 3.1.6 This section summarises the results from the diffusion tube sites that are considered relevant for the assessment of air quality in this study area.

Table 4: Annual mean NO₂ concentrations recorded at diffusion tube monitoring sites¹⁰

Site	Ordnance Survey coordinates	Annual mean NO ₂ concentrations (µg/m ³)				
		2008	2009	2010	2011	2012
Lancaster Circus (621)	407321,287531	58	62	65	60	No data

Background pollutant concentrations

- 3.1.7 Estimates of background air quality have been taken from Defra maps¹¹. Background NO₂ concentrations are below air quality standards within the Washwood Heath to Curzon Street area, with the exception of areas within Birmingham city centre, to the west of the proposed Curzon Street station (as confirmed by NO₂ concentrations measured by the BCC at Lancaster Circus), and areas along the M6, A47 Heartlands Parkway and Fort Parkway to the north of the HS2 route (as confirmed by NO₂ concentrations measured at automatic monitoring stations along Tyburn Road). Background PM₁₀ concentrations are well below air quality standards throughout the area, with PM₁₀ annual mean concentrations ranging approximately from 16 µg/m³ to 25 µg/m³ in 2012.

Local emission sources

- 3.1.8 The main source of pollution within the study area is road vehicles. Major roads include the A38, A41, A47 and A4540. Other emission sources include permitted part A processes located within the industrial parts of the study area, including that to the

⁸ No 90.4th percentile of daily mean PM₁₀ concentration data is available

⁹ Source: West Midlands Air Quality Group website; www.wmair.org; Accessed July 2013

¹⁰ Source: West Midlands Air Quality Group website; www.wmair.org; Accessed July 2013

¹¹ Defra (2013), Background Pollutant Concentration Data Maps for Base year 2010.

east of the A38(M) in Vauxhall, Saltley and Washwood Heath. Contributions to local pollutant concentrations made by these industrial installations are included within background concentrations used in this assessment.

3.2 Receptors

Human

Construction phase

- 3.2.1 There are many human receptors in the Washwood Heath to Curzon Street area that are close to construction areas. These include, but are not limited to, properties on Drews Lane, Warren Road (including the Leigh Junior, Infant and Nursery school), Common Lane, Northumberland Street, Bartholomew Row (NTI Birmingham), Curzon Street (Birmingham School of Acting at Millennium Point), Bordesley Street and Masshouse Lane. Receptors at greatest risk of dust effects are indicated in Volume 5: Figure AQ-02-26-01.

Operational phase

- 3.2.2 There are numerous sensitive receptors located with zoom of the local road network within the Washwood Heath to Curzon Street area. Within the city centre, these include residential flats and apartments located in close proximity with the future Curzon Street Station on Moor Street, Allison Street, Bordesley Street or Park Street. Beyond the city centre, these include residential houses and apartments like those in Staniforth Street, Windsor Street or in close proximity with Curzon Circus.

Ecological

Construction phase

- 3.2.3 No ecological receptors in the Washwood Heath to Curzon Street area are considered likely to be affected by air quality as a result of the construction phase.

Operational phase

- 3.2.4 No ecological receptors in the Washwood Heath to Curzon Street area are considered likely to be affected by air quality as a result of the operational phase.

4 Dust impact evaluation and risk rating

4.1.1 The following sections provide details of the assessment of construction impacts following the Institute of Air Quality Management (IAQM) guidance¹². Where considered useful to identify receptors and their relationship to the construction activity, a specific figure is provided.

Table 5: Evaluation and risk rating of construction activities

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact with CoCP mitigation measures	Principal justifications
Properties along Drews Lane/Bromford Lane (Volume 5 Map AQ-02-026-01 Figures 26.1, 26.6 and 26.7)						
Demolition	190m	Large	Medium	Medium	Negligible	Demolition of the UK Mail depot. No properties within 100m of demolition works. Total building volume more than 50,000m ³ .
Earthworks	60m	Large	Medium	High	Negligible	Digging of the Bromford tunnel west portal. No properties within 50m of the earthworks. Total site area more than 10,000m ² . Densely populated area near the site boundary.

¹² Institute of Air Quality Management (IAQM), (2011), *Guidance on the assessment of the impacts of construction on air quality and the determination of their significance*

Construction	30m	Medium	Medium	High	Negligible	<p>Construction of the west portal main compound.</p> <p>No properties within 20m of the construction works.</p> <p>Total building volume 25,000 to 100,000m³.</p> <p>Densely populated area.</p> <p>10-100 dwellings within 50m of the site boundary.</p>
Trackout	20m	Large	High	High	Slight Adverse	<p>Properties within 20 - 25m of construction route.</p> <p>Assumption of more than 100 HDV trips per day.</p> <p>Densely populated area.</p>

Properties along Warren Road/Common Lane (Volume 5 Map AQ-02-026-01 Figure 26.2)

Demolition	25m	Large	High	High	Slight Adverse	<p>Demolition of the former railway works depot and industrial buildings on site of proposed Washwood Heath depot.</p> <p>Total building volume more than 50,000m³.</p> <p>Densely populated area.</p> <p>10 to 100 dwellings within 50m of the site boundary.</p>
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Earthworks	60m	Medium	Medium	High	Negligible	<p>Earthworks associated with the diversion of Washwood Heath Brook and the digging of balancing ponds.</p> <p>No properties within 50m of the earthworks.</p> <p>Total site area 2,500 - 10,000m².</p> <p>Densely populated area.</p>
Construction	120m	Large	Medium	High	Negligible	<p>Construction of the Washwood Heath depot.</p> <p>No properties within 100m of the construction works.</p> <p>Total building volume more than 100,000m³.</p> <p>Densely populated area near the site boundary.</p>
Trackout	50m	Large	Medium	Medium	Negligible	<p>Properties within 50 - 100m of construction route.</p> <p>Assumption of more than 100 HDV trips per day.</p> <p>Densely populated area.</p>

Properties along Arley Road

Demolition	70m	Medium	Medium	Medium	Negligible	<p>Demolition of several warehouse buildings.</p> <p>No properties within 20m of demolition works.</p> <p>Total building volume 20,000 - 50,000m³.</p> <p>Densely populated area.</p> <p>10-100 dwellings within 100m of the site boundary.</p>
Earthworks	160m	Large	Medium	Medium	Negligible	<p>Earthworks associated with the rising of the Proposed Scheme.</p> <p>No properties within 100m of the earthworks.</p> <p>Total site area more than 10,000m².</p>
Construction	120m	Medium	Low	Medium	Negligible	<p>Construction of Aston Church Road overbridge.</p> <p>No properties within 100m of the construction works.</p> <p>Total building volume 25,000 - 100,000m³.</p>

Trackout	Less than 20m	Large	High	High	Slight Adverse	Properties within 20m of construction route. Assumption of more than 100 HDV trips per day. Densely populated area.
Properties along Mount Street						
Demolition	340m	Large	Medium	Low	Negligible	Demolition of several warehouse buildings. No properties within 200m of demolition works. Total building volume more than 50,000m ³ .
Earthworks	320m	Large	Low	Low	Negligible	Earthworks associated with the rising of the scheme. No properties within 200m of the earthworks. Total site area more than 10,000m ² .
Construction	320m	Medium	Low	Low	Negligible	Construction of retaining wall along railway line. No properties within 200m of the construction works. Total building volume 25,000 to 100,000m ³ .

Trackout	N/A	N/A	N/A	N/A	N/A	No construction route within 100m of properties.
Properties along Adderley Road						
Demolition	200m	Medium	Low	Low	Negligible	<p>Demolition of a warehouse building.</p> <p>No properties within 200m of demolition works.</p> <p>Total building volume 20,000 to 50,000m³.</p>
Earthworks	220m	Large	Low	Low	Negligible	<p>Earthworks associated with rising of the scheme (embankment).</p> <p>No properties within 200m of the earthworks.</p> <p>Total site area more than 10,000m².</p>
Construction	240m	Large	Low	Low	Negligible	<p>Construction of a retaining wall along the scheme.</p> <p>No properties within 200m of the construction works.</p> <p>Total building volume more than 100,000m³.</p>

Trackout	Less than 20m	Large	High	High	Slight Adverse	Properties within 20m of construction route. Assumption of more than 100 HDV trips per day. Densely populated area.
Properties along Melvina Road/Goodrick Way						
Demolition	N/A	N/A	N/A	N/A	N/A	No demolition works within 350m of properties.
Earthworks	N/A	N/A	N/A	N/A	N/A	No earthworks within 350m of properties.
Construction	N/A	N/A	N/A	N/A	N/A	No construction works within 350m of properties.
Trackout	40m	Large	Medium	Medium	Negligible	No properties within 20m of construction route. Assumption of more than 100 HDV trips per day. Densely populated area.

Properties along Northumberland Street/Vauxhall Grove/Erskine Street (Volume 5 Map AQ-02-026-01 Figure 26.3)

Demolition	60m	Small	Low	High	Negligible	<p>Demolition of various buildings (industrial, offices, commercial).</p> <p>No properties within 20m of demolition works.</p> <p>Total building volume less than 20,000m³.</p> <p>Densely populated area.</p> <p>10 to 100 dwellings within 50m of site boundary.</p>
Earthworks	40m	Medium	Medium	High	Negligible	<p>Earthworks associated with digging of a balancing pond.</p> <p>No properties within 20m of the earthworks.</p> <p>Total site area 2,500 - 10,000m².</p> <p>Densely populated area.</p> <p>10 to 100 dwellings within 50m of site boundary.</p>

Construction	40m	Large	High	High	Slight Adverse	<p>Construction of Curzon Street No.2 viaduct.</p> <p>No properties within 20m of the construction works.</p> <p>Total building volume more than 100,000m³.</p> <p>Densely populated area.</p> <p>10 to 100 dwellings within 50m of site boundary.</p>
Trackout	Less than 20m	Large	High	High	Slight Adverse	<p>Properties within 20m of construction route.</p> <p>Assumption of more than 100 HDV trips per day.</p> <p>Densely populated area.</p>

Properties along Masshouse Lane/NTI Birmingham and Birmingham School of Acting (Volume 5 Map AQ-02-026-01 Figure26.5)

Demolition	N/A	N/A	N/A	N/A	N/A	No demolition works in that area.
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Earthworks	40m	Medium	Medium	High	Negligible	<p>Earthworks associated with modification of the road network and land preparation prior to construction of Curzon Street station.</p> <p>No properties within 20m of the earthworks.</p> <p>Assumption on total material moved 20,000 to 100,000 tonnes.</p> <p>Densely populated area.</p>
Construction	40m	Large	High	High	Slight Adverse	<p>Construction of Curzon Street station.</p> <p>No properties within 20m of the construction works.</p> <p>Total building volume more than 100,000m³.</p> <p>Densely populated area.</p>
Trackout	Less than 20m	Large	High	High	Slight Adverse	<p>Properties within 20m of construction route.</p> <p>Assumption of more than 100 HDV trips per day.</p> <p>Densely populated area.</p>
Properties along Bordesley Street (Volume 5 Map AQ-02-026-01 Figure 26.4)						
Demolition	N/A	N/A	N/A	N/A	N/A	No demolition works in that area.

Earthworks	80m	Medium	Medium	Medium	Negligible	<p>Earthworks associated with modification of the road network and land preparation prior to construction of Curzon Street station.</p> <p>No properties within 50m of the earthworks.</p> <p>Assumption on total material moved 20,000 to 100,000 tonnes.</p>
Construction	80m	Large	Medium	Medium	Negligible	<p>Construction of Curzon Street station.</p> <p>No properties within 50m of the construction works.</p> <p>Total building volume more than 100,000m³.</p>
Trackout	Less than 20m	Large	High	High	Slight Adverse	<p>Properties within 20m of construction route.</p> <p>Assumption of more than 100 HDV trips per day.</p> <p>Densely populated area.</p>

Table 6: Summary of construction dust impacts and effects

Location	Magnitude of impact	Effect of dust-generating activities	Additional mitigation
Properties along Drews Lane/Bromford Lane	Slight adverse	Not significant	None required
Properties along Warren Road/Common Lane	Slight adverse	Not significant	None required
Properties along Arley Road	Slight adverse	Not significant	None required
Properties along Mount Street	Negligible	Not significant	None required
Properties along Adderley Road	Slight adverse	Not significant	None required
Properties along Melvina Road/Goodrick Way	Negligible	Not significant	None required
Properties along Northumbria Street/Vauxhall Grove/Erskine Street	Slight adverse	Not significant	None required
Properties along Masshouse Lane/NTI Birmingham and Birmingham School of Acting	Slight adverse	Not significant	None required
Properties along Bordesley Street	Slight adverse	Not significant	None required

5 Air quality assessment - road traffic

5.1 Overall assessment approach

- 5.1.1 The air quality assessment for road related emissions has used three different approaches based on the scale of changes in traffic and road alignment. Where the Design Manual for Roads and Bridges¹³ (DMRB) thresholds detailed in the SMR (Volume 5: Appendix CT-001-000/1) will not be exceeded, any additional assessment is not required as the air quality impacts will be minimal. If these thresholds are breached, then a quantitative assessment has been carried out.
- 5.1.2 If it is considered unlikely that air quality standards will be exceeded and the road configuration is a simple one, then the DMRB screening method has been used to predict changes in air quality. Where there will be a risk of standards being exceeded, where the road layout is considered to be complex or where the use of the DMRB screening method has indicated that there will be a potential exceedance of air quality standards, then the atmospheric dispersion model ADMS-Roads has been used for the assessment. Professional judgment has been used to select the appropriate tool for each area.
- 5.1.3 Due to the risk of standards being exceeded in this study area, the ADMS-Roads was considered to be a suitable tool for the assessment.

5.2 Model inputs and verification

Model parameters for detailed assessment

- 5.2.1 ADMS-Roads was used for the detailed assessment. A surface roughness length of 1.5m, meteorological site surface roughness length of 0.2m, minimum Monin Obukhov length of 100m and latitude of 52.5 degrees were used in the detailed assessment. All other parameters were model default settings. Meteorological data for the year 2012 from the Birmingham Elmdon monitoring site was used.

Model verification

- 5.2.2 Verification has been undertaken using data gathered by NO₂ diffusion tubes at eight locations within the Washwood Heath to Curzon Street area. The diffusion tubes were located on Jennens Road (grid ref: 407702,287258), Park Street/Masshouse (grid ref: 407586,287023), Staniforth Street (grid ref: 407428,287733), Keeley Street (grid ref: 408595,286487), High Street (grid ref: 408032,286313), Allison Street (407545,286563), Park Street (407416,286596) and Washwood Heath Road (409935,288511).
- 5.2.3 The diffusion tubes survey was undertaken over three months, from the 20th of March 2013 to the 12th of June 2013. Measured concentrations were annualised for the year 2012 using data from four automatic monitoring stations located within 50 miles of the study area (Birmingham Acocks Green, Birmingham Tyburn, Coventry Memorial Park and Leamington Spa), following the methodology described in the Local Air

¹³ Highways Agency, (2007), *The Design Manual for Roads and Bridges (Volume 11, Section 3, Part 1 Air Quality HA207/07)*

Quality Management Technical Guidance TG (09)¹⁴. Except for tube located along Washwood Heath Road, for which the monitoring period ran from the 18th July 2012 to the 10th October 2012, the selected automatic monitoring stations were Birmingham Acocks Green, Birmingham Tyburn, Leamington Spa and Walsall Woodlands). A national bias adjustment factor, sourced from Defra, was then applied to the annual mean concentrations. The annualisation process is summarised in Table 7.

Table 7: Annualisation of NO₂ diffusion tubes monitored concentrations

Site	Period monitored concentration (µg/m ³)	Concentrations annualised to 2012 (µg/m ³)	2012 bias adjusted annual mean (µg/m ³)
Jennens Road (407702, 287258)	35.3	46.6	45.2
Park Street / Masshouse (407586, 287023)	44.6	62.3	60.5
Staniforth Street (407428, 287733)	34.4	45.4	44.1
Keeley Street (408595, 286487)	34.0	44.9	43.6
High Street (408032, 286313)	47.4	61.5	59.6
Allison Street (407545, 286563)	40.1	52.1	50.5
Park Street (407416, 286596)	71.1	91.3	88.6
Washwood Heath Road (409935, 288511)	39.6	53.3	51.7

5.2.4 Verification was undertaken for the base year of 2012 for NO₂ comparing monitored and modelled concentrations. The results of this comparison are shown in Table 8.

Table 8: Comparison of monitored and modelled NO₂ concentrations

Site	Monitored concentration (µg/m ³)	Modelled concentration (µg/m ³)	Difference [(modelled - monitored)/monitored] * 100
Jennens Road (407702, 287258)	45.3	40.8	-9.9%
Park Street / Masshouse (407586, 287023)	60.5	52.6	-13.1%
Staniforth Street (407428, 287733)	44.1	53.3	+20.9%
Keeley Street (408595, 286487)	43.6	38.6	-11.5%
High Street (408032, 286313)	59.6	43.0	-27.9%

¹⁴ Department for Environment, Food and Rural Affairs, (2009), *Local Air Quality Management Technical Guidance LAQM.TG(09)*.

Site	Monitored concentration ($\mu\text{g}/\text{m}^3$)	Modelled concentration ($\mu\text{g}/\text{m}^3$)	Difference [(modelled - monitored)/monitored] * 100
Allison Street (407545, 286563)	50.5	41.1	-18.6%
Park Street (407416, 286596)	88.6	59.8	-32.5%
Washwood Heath Road (409935, 288511)	51.7	39.4	-23.8%

- 5.2.5 As the majority of modelled NO₂ concentrations were within $\pm 25\%$ of the monitored concentrations, no model adjustment was undertaken.

5.3 Construction traffic model

- 5.3.1 Construction traffic data used in this assessment are detailed in Volume 5: Appendix TR-001-000. Scenarios assessed were without the Proposed Scheme construction and with the Proposed Scheme construction for month 44 (Birmingham city centre) and month 35 (B4114 Saltley Viaduct area) of the construction period. It is during these months when the change in traffic flow and composition, as a result of the construction works, exceeds the DMRB screening criteria and therefore requires assessment. For each considered area (Birmingham city centre and B4114 Saltley Viaduct area), the selected month corresponds to the construction traffic scenario with the highest predicted impact on selected receptors.

Receptors assessed

- 5.3.2 Sensitive receptors within 200m of road links which meet the DMRB criteria have been included in the assessment. These are representative of worst-case exposure locations. The assessed receptors are listed in Table 9 and shown on Volume 5: Map AQ-01-026.

Table 9: Modelled receptors (construction phase)

Receptor	Description/Location	Ordnance Survey coordinates	Scenarios assessed with the Proposed Scheme
26-1	Flats, Moor Street	407413,286582	Month 44
26-2	Flats, Allison Street	407553,286612	Month 44
26-3	House, Bordesley Street	407591,286758	Month 44
26-4	Hive flats, Masshouse	407629,287091	Month 44
26-5	Hive flats, Masshouse	407537,287062	Month 44
26-6	Jennens Street B4114	407678,287236	Month 44
26-7	The Old Crown	407995,286319	Month 44
26-8	Avoca Court	408151,285905	Month 44
26-9	Clearys	408071,285807	Month 44
26-10	House, Glover Street	408281,286664	Month 44
26-11	Student Flats	407474,287360	Month 44
26-12	Birmingham Children's Hospital	407373,287515	Month 44
26-13	Flats, Staniforth Street	407442,287780	Month 44
26-14	Flats, Bagot Street	407421,287927	Month 44
26-15	House, Windsor Street	408151,287772	Month 44
26-16	Flats, Windsor Street	408245,287333	Month 44
26-17	Flats, Curzon Circle	408235,287228	Month 44
26-18	Flats, Curzon Circle	408281,287185	Month 44
26-19	House, Hawthorn Close	408603,286457	Month 44
26-20	House, Coventry Road	408673,286172	Month 44
26-21	House, Ferndale Crescent	408240,285617	Month 44
26-22	Flats, Adderley Gardens	409558,288063	Month 35
26-23	Flats on B4114	409680,288239	Month 35
26-24	Houses on Washwood Heath Road	409739,288321	Month 35

Background concentrations

5.3.4 The background concentrations used in the assessment are shown in Table 10 taken from the Defra maps.

Table 10: Background 2017 concentrations at assessed receptors

Receptor (or zone of receptors)	Concentrations ($\mu\text{g}/\text{m}^3$)		
	NO _x	NO ₂	PM ₁₀
(26-1) Flats, Moore Street	51.7	30.5	18.6
(26-2) Flats, Allison Street	51.7	30.5	18.6
(26-3) House, Bordesley Street	51.7	30.5	18.6
(26-4) Hive Flats, Masshouse	67.4	36.6	20.7
(26-5) Hive Flats, Masshouse	67.4	36.6	20.7
(26-6) Jennens Street B4114	67.4	36.6	20.7
(26-7) The Old Crown	51.7	30.5	18.6
(26-8) Avoca Court	56.0	32.3	19.7
(26-9) Clearys	56.0	32.3	19.7
(26-10) House, Glover Street	60.0	33.8	20.2
(26-11) Student Flats	67.4	36.6	20.7
(26-12) Birmingham Children's Hospital	67.4	36.6	20.7
(26-13) Flats, Staniforth Street	67.4	36.6	20.7
(26-14) Flats, Bagot Street	67.4	36.6	20.7
(26-15) House, Windsor Street	66.2	36.1	20.1
(26-16) Flats, Windsor Street	66.2	36.1	20.1
(26-17) Flats, Curzon Circle	66.2	36.1	20.1
(26-18) Flats, Curzon Circle	66.2	36.1	20.1
(26-19) House, Hawthorn Close	60.0	33.8	20.2
(26-20) House,	60.0	33.8	20.2

Receptor (or zone of receptors)	Concentrations ($\mu\text{g}/\text{m}^3$)		
	NO _x	NO ₂	PM ₁₀
Coventry Road			
(26-21) House, Ferndale Crescent	56.0	32.3	19.7
(26-22) Flats, Adderley Gardens	55.1	31.8	18.4
(26-23) Flats on B ₄₁₁₄	55.1	31.8	18.4
(26-24) Houses on Washwood Heath Road	55.1	31.8	18.4

Detailed modelling results

5.3.5 This section provides the summary of the modelled pollutant concentrations for the assessed receptors in the construction phase. The magnitude of change and impact descriptors are derived following the Environmental Protection UK (EPUK) methodology¹⁵.

Table 11: Summary of ADMS-Roads annual mean NO₂ results (construction phase)

Receptor	Concentrations (µg/m ³)			Change in concentrations (µg/m ³)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
26-1	54.0	41.7	40.9	-0.8	Small	Slight beneficial
26-2	40.1	32.9	33.7	0.8	Small	Negligible
26-3	40.0	31.9	32.0	0.1	Imperceptible	Negligible
26-4	53.6	38.1	38.0	-0.1	Imperceptible	Negligible
26-5	43.1	34.1	35.5	1.4	Small	Negligible
26-6	41.0	33.3	33.5	0.2	Imperceptible	Negligible
26-7	45.3	35.9	36.0	0.1	Imperceptible	Negligible
26-8	35.8	28.6	28.6	<0.1	Imperceptible	Negligible
26-9	35.4	28.3	28.3	<0.1	Imperceptible	Negligible
26-10	38.0	30.4	30.4	<0.1	Imperceptible	Negligible
26-11	55.4	32.7	32.8	0.1	Imperceptible	Negligible
26-12	53.2	32.4	32.5	0.1	Imperceptible	Negligible
26-13	52.5	32.6	32.7	0.1	Imperceptible	Negligible
26-14	44.6	32.9	32.9	<0.1	Imperceptible	Negligible
26-15	41.7	33.4	33.5	0.1	Imperceptible	Negligible
26-16	44.9	33.8	34.2	0.4	Small	Negligible
26-17	41.6	34.3	35.0	0.7	Small	Negligible
26-18	42.4	35.1	35.5	0.4	Small	Negligible
26-19	38.5	32.2	32.3	0.1	Imperceptible	Negligible
26-20	39.5	34.1	34.1	<0.1	Imperceptible	Negligible
26-21	38.0	31.9	31.9	<0.1	Imperceptible	Negligible
26-22	38.4	33.9	34.6	0.7	Small	Negligible
26-23	38.4	34.0	33.4	-0.6	Small	Negligible

¹⁵ Environmental Protection UK (EPUK) (2010), Development Control: Planning for Air Quality.

Receptor	Concentrations ($\mu\text{g}/\text{m}^3$)			Change in concentrations ($\mu\text{g}/\text{m}^3$)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
26-24	38.7	34.2	33.4	-0.8	Small	Negligible

Table 12: Summary of ADMS-Roads annual mean PM₁₀ results (construction phase)

Receptor	Concentrations ($\mu\text{g}/\text{m}^3$)			Change in concentrations ($\mu\text{g}/\text{m}^3$)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
26-1	22.3	19.9	19.8	-0.1	Imperceptible	Negligible
26-2	20.5	18.9	19.0	0.1	Imperceptible	Negligible
26-3	20.4	18.8	18.8	<0.1	Imperceptible	Negligible
26-4	23.2	20.4	20.3	-0.1	Imperceptible	Negligible
26-5	21.6	19.7	19.9	0.2	Imperceptible	Negligible
26-6	21.3	19.6	19.6	<0.1	Imperceptible	Negligible
26-7	21.5	19.7	19.7	<0.1	Imperceptible	Negligible
26-8	20.1	18.6	18.6	<0.1	Imperceptible	Negligible
26-9	20.1	18.6	18.6	<0.1	Imperceptible	Negligible
26-10	20.8	19.2	19.2	<0.1	Imperceptible	Negligible
26-11	23.5	19.5	19.5	<0.1	Imperceptible	Negligible
26-12	23.6	19.5	19.5	<0.1	Imperceptible	Negligible
26-13	23.5	19.5	19.5	<0.1	Imperceptible	Negligible
26-14	22.0	19.6	19.6	<0.1	Imperceptible	Negligible
26-15	20.9	19.1	19.1	<0.1	Imperceptible	Negligible
26-16	21.2	19.1	19.2	0.1	Imperceptible	Negligible
26-17	20.7	19.2	19.3	0.1	Imperceptible	Negligible
26-18	20.9	19.4	19.4	<0.1	Imperceptible	Negligible
26-19	20.7	19.4	19.4	<0.1	Imperceptible	Negligible
26-20	20.9	19.6	19.6	<0.1	Imperceptible	Negligible
26-21	20.3	19.0	19.0	<0.1	Imperceptible	Negligible
26-22	20.1	19.0	19.2	0.2	Imperceptible	Negligible
26-23	20.1	19.0	18.8	-0.2	Imperceptible	Negligible
26-24	20.2	19.1	18.8	-0.3	Imperceptible	Negligible

Assessment of significance

- 5.3.6 The impact at all receptors for changes to annual mean NO₂ and PM₁₀ concentrations is predicted to be negligible, except for receptor 26-1 at which a slight beneficial impact is predicted for NO₂ concentrations. No perceptible changes to daily mean PM₁₀ concentrations are predicted as a result of the construction of the Proposed Scheme.
- 5.3.7 Air quality effects arising from changes to traffic associated with the construction of the Proposed Scheme is insignificant. 2017 pollutant concentrations are predicted to be below or well below the relevant air quality standards except for receptor 26-1 at which the predicted NO₂ annual mean concentration is above the objective value.

5.4 Operational traffic model

- 5.4.1 Operational traffic data used in this assessment are detailed in Volume 5: AppendixTR-01-000. Scenarios assessed were without the Proposed Scheme and with the Proposed Scheme in 2026.

Receptors assessed

- 5.4.2 Sensitive receptors within 200m of road links that meet the DMRB criteria have been included in this assessment. These are representative of worst-case exposure locations. The assessed receptors are listed in Table 13 and Volume 5: Map AQ-01-026.

Table 13: Modelled receptors (operational phase)

Receptor	Description/Location	Ordnance Survey coordinates
26-1	Flats, Moor Street	407413,286582
26-2	Flats, Allison Street	407553,286612
26-3	House, Bordesley Street	407591,286758
26-4	Hive Flats, Masshouse	407629,287091
26-5	Hive Flats, Masshouse	407537,287062
26-6	Jennens Street B4114	407678,287236
26-7	The Old Crown	407995,286319
26-8	Avoca Court	408151,285905
26-9	Clearys	408071,285807
26-10	House, Glover Street	408281,286664
26-11	Student Flats	407474,287360
26-12	Birmingham Children's Hospital	407373,287515
26-13	Flats, Staniforth Street	407442,287780
26-14	Flats, Bagot Street	407421,287927
26-15	House, Windsor Street	408151,287772
26-16	Flats, Windsor Street	408245,287333

Receptor	Description/Location	Ordnance Survey coordinates
26-17	Flats, Curzon Circle	408235,287228
26-18	Flats, Curzon Circle	408281,287185
26-19	House, Hawthorn Close	408603,286457
26-20	House, Coventry Road	408673,286172
26-21	House, Ferndale Crescent	408240,285617

Background concentrations

5.4.3 The background concentrations used in the assessment are shown in Table 14 taken from the Defra maps.

Table 14: Background 2026 concentrations at assessed receptors

Receptor (or zone of receptors)	Concentrations ($\mu\text{g}/\text{m}^3$)		
	NO _x	NO ₂	PM ₁₀
(26-1) Flats, Moore Street	43.4	26.7	18.0
(26-2) Flats, Allison Street	43.4	26.7	18.0
(26-3) House Bordesley Street	43.4	26.7	18.0
(26-4) Hive Flats, Masshouse	46.3	28.0	18.9
(26-5) Hive Flats, Masshouse	46.3	28.0	18.9
(26-6) Jennens Street B4114	46.3	28.0	18.9
(26-7) The Old Crown	43.4	26.7	18.0
(26-8) Avoca Court	37.2	23.7	18.0
(26-9) Clearys	37.2	23.7	18.0
(26-10) House, Glover Street	40.6	25.3	18.5
(26-11) Student Flats	46.3	28.0	18.9
(26-12) Birmingham Children's Hospital	46.3	28.0	18.9
(26-13) Flats, Staniforth Street	46.3	28.0	18.9
(26-14) Flats, Bagot Street	46.3	28.0	18.9
(26-15) House, Windsor Street	46.3	27.9	18.3

Receptor (or zone of receptors)	Concentrations ($\mu\text{g}/\text{m}^3$)		
	NO _x	NO ₂	PM ₁₀
(26-16) Flats, Windsor Street	46.3	27.9	18.3
(26-17) Flats, Curzon Circle	46.3	27.9	18.3
(26-18) Flats, Curzon Circle	46.3	27.9	18.3
(26-19) House, Hawthorn Close	40.6	25.3	18.5
(26-20) House, Coventry Road	40.6	25.3	18.5
(26-21) House, Ferndale Crescent	37.2	23.7	18.0

Detailed modelling results

5.4.4 This section provides the summary of the modelled pollutant concentrations for the assessed receptors in the operational phase. The magnitude of change and impact descriptors are derived following the Environmental Protection UK (EPUK) methodology¹⁶.

Table 15: Summary of ADMS-Roads annual mean NO₂ results (operational phase)

Receptor	Concentrations (µg/m ³)		Change in concentrations (µg/m ³)	Magnitude of change	Impact descriptor
	2026 without Proposed Scheme	2026 with Proposed Scheme			
26-1	32.0	30.5	-1.5	Small	Negligible
26-2	27.8	28.0	0.2	Imperceptible	Negligible
26-3	27.6	27.3	-0.3	Imperceptible	Negligible
26-4	30.4	29.2	-1.2	Small	Negligible
26-5	28.9	28.9	<0.1	Imperceptible	Negligible
26-6	28.5	28.3	-0.2	Imperceptible	Negligible
26-7	29.0	28.8	-0.2	Imperceptible	Negligible
26-8	24.1	24.0	-0.1	Imperceptible	Negligible
26-9	24.0	23.9	-0.1	Imperceptible	Negligible
26-10	25.8	25.8	<0.1	Imperceptible	Negligible
26-11	28.3	28.2	-0.1	Imperceptible	Negligible
26-12	28.1	28.1	<0.1	Imperceptible	Negligible
26-13	28.2	28.2	<0.1	Imperceptible	Negligible
26-14	28.3	28.3	<0.1	Imperceptible	Negligible

¹⁶ Environmental Protection UK (EPUK) (2010), Development Control: Planning for Air Quality.

Receptor	Concentrations ($\mu\text{g}/\text{m}^3$)		Change in concentrations ($\mu\text{g}/\text{m}^3$)	Magnitude of change	Impact descriptor
	2026 without Proposed Scheme	2026 with Proposed Scheme			
26-15	28.5	28.4	-0.1	Imperceptible	Negligible
26-16	28.3	28.3	<0.1	Imperceptible	Negligible
26-17	28.5	28.6	0.1	Imperceptible	Negligible
26-18	29.0	29.1	0.1	Imperceptible	Negligible
26-19	26.6	26.5	-0.1	Imperceptible	Negligible
26-20	27.4	27.2	-0.2	Imperceptible	Negligible
26-21	25.5	24.9	-0.6	Small	Negligible

Table 16: Summary of ADMS-Roads annual mean PM₁₀ results (operational phase)

Receptor	Concentrations ($\mu\text{g}/\text{m}^3$)		Change in concentrations ($\mu\text{g}/\text{m}^3$)	Magnitude of change	Impact descriptor
	2026 without Proposed Scheme	2026 with Proposed Scheme			
26-1	19.1	18.8	-0.3	Imperceptible	Negligible
26-2	18.3	18.3	<0.1	Imperceptible	Negligible
26-3	18.2	18.2	<0.1	Imperceptible	Negligible
26-4	19.8	19.3	-0.5	Small	Negligible
26-5	19.1	19.2	0.1	Imperceptible	Negligible
26-6	19.1	19.0	-0.1	Imperceptible	Negligible
26-7	19.1	19.0	-0.1	Imperceptible	Negligible
26-8	18.1	18.1	<0.1	Imperceptible	Negligible

Receptor	Concentrations ($\mu\text{g}/\text{m}^3$)		Change in concentrations ($\mu\text{g}/\text{m}^3$)	Magnitude of change	Impact descriptor
	2026 without Proposed Scheme	2026 with Proposed Scheme			
26-9	18.0	18.0	<0.1	Imperceptible	Negligible
26-10	18.6	18.6	<0.1	Imperceptible	Negligible
26-11	19.0	19.0	<0.1	Imperceptible	Negligible
26-12	18.9	18.9	<0.1	Imperceptible	Negligible
26-13	19.0	19.0	<0.1	Imperceptible	Negligible
26-14	19.0	19.0	<0.1	Imperceptible	Negligible
26-15	18.5	18.5	<0.1	Imperceptible	Negligible
26-16	18.4	18.4	<0.1	Imperceptible	Negligible
26-17	18.5	18.5	<0.1	Imperceptible	Negligible
26-18	18.7	18.8	0.1	Imperceptible	Negligible
26-19	18.8	18.8	<0.1	Imperceptible	Negligible
26-20	19.0	19.0	<0.1	Imperceptible	Negligible
26-21	18.4	18.3	-0.1	Imperceptible	Negligible

Assessment of significance

- 5.4.5 The impact descriptor at all receptors for changes to annual mean NO₂ and PM₁₀ is negligible. No perceptible changes to daily mean PM₁₀ concentrations are predicted as a result of the operation of the Proposed Scheme.
- 5.4.6 Air quality effects arising from changes to traffic associated with the operation of the Proposed Scheme are insignificant. 2026 pollutant concentrations are predicted to be well below the relevant air quality standards and the impact descriptor at all assessed receptors is negligible.

6 References

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